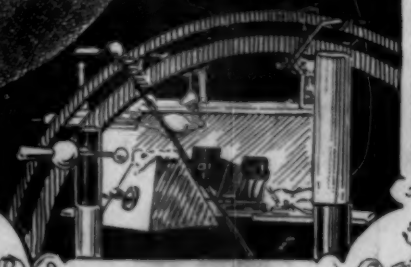
Vol. XIII. No. 5. November, 1903.

THE AMERICAN X-RAY JOURNAL

A MONTHLY DEVOTED TO THE PRACTICAL APPLICATION OF THE NEW SCIENCE AND TO THE PHYSICAL IMPROVEMENT OF MAN.



CHICAGO, ILL.

THE AMERICAN X-RAY JOURNAL

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Editor, T. PROCTOR HALL, A. M., Ph. D., M. D.
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Address Communications to Dr. H. Preston Pratt, Managing Editor, Masonic Temple, Chicago.

DR. BYRON ROBINSON.

THE AMERICAN
X-RAY JOURNAL.
Devoted to Practical X-Ray Work and Allied Arts and Sciences.

VOL. XIII. CHICAGO, NOVEMBER, 1903. No. 5

Electro-Therapy.

A Course of Twenty-four Lessons under the auspices of the Chicago College of X-Ray and Electro-Therapeutics

LESSON 6—FORESIS.

The migration of ions during electrolysis has already been discussed. When the electrolytic process is carried on in such a manner that medicaments are carried by it into the body the process is known as foresis. When the arrangements are such that the kations which are carried down stream (electrically) are carried into the body, the process is called kataforesis. The name anaforesis, on the other hand, is applied to the passage of the anions as they pass up stream toward the anode and into the body. In using foresis for therapeutic purposes careful note must be made of the therapeutic effect of the various set of ions. At this point the average physician is at a loss. It is only during the last few years that scientific investigations have been made into the physiologic and therapeutic effects of ions, distinguishing these from the molecular or salt effect of compounds. A good deal has still to be learned in this direction. Probably the simplest way to consider the matter for the present is to regard the ions which are carried into the body during foresis as replacing the corresponding ions which previously existed in the salts in the tissues; for example, during foresis potassium iodid (K I) placed on the surface of the body under the anode (positive electrode) is decomposed, the anions (I) move toward the electrode close at hand and the kations (K) are carried into the body, replacing there the sodium in such compounds as sodium chlorid (NaCl) and forming potassium chlorid (KCl). From the known effects of these compounds something of the effects of anaforesis and kataforesis may be inferred. The effect of foresis in all cases is to modify the chemical composition of the tissues. This modification is most pronounced near the surface or where the electrodes are applied, and where the current density is greatest.

The metals, the alkaloids and all other bases are kations. The elements of the chlorin and sulfur groups, and all acid radicals, are anions.

Foresis can be most satisfactorily induced by the direct current. The direct current may be steady, irregular, interrupted, or of any other quality so long as it is direct. In some cases the diffusion of ions is facilitated by using the alternating current, resulting in a scattering rather than a migration of the ions.

The velocities with which the different ions travel vary greatly. Not much data of therapeutic value to the physician has as yet been accumulated on this point. In foresis the physician must therefore be guided by the clinical results of himself and others as to the amount of current and length of time required for a given mode of treatment. The choice of

electrodes is important. The indifferent electrode must be large, so as to distribute the current as much as possible. Each may be made of tin, porous earth or clay or of almost any metal. If made of sheet copper, zinc or lead some absorbent cotton or porous paper must be placed in layers beneath the electrode and wet with water, which may contain salt in solution. This indifferent electrode must be placed on some part of the body that is only slightly sensitive to the current, and as close as possible, in a direct line thru the tissue to be treated, to the active electrode. Wherever the conditions are such as to permit it the indifferent electrode may conveniently be made a basin of water or a bath tub.

The electromotive force necessary depends entirely upon the amount of current required and upon resistance of tissue to be treated. A milliampere meter is required in nearly all cases and a rheostat is necessary to control the current. In all cases the current is turned on very gradually at first. After some minutes a certain amount of tolerance is established and the current can be increased without injury.

Probably the earliest practicable application of foresis in medical treatment consisted in attempts to produce local anesthesia by conveying medicaments thru the skin. Kataforesis was the action first recognized, and experiments made with compounds whose kations were analgesic were more or less successful, while a few cases in which attempts were made to introduce into the body anions by kataforesis (the operator being ignorant of anaforesis) were a failure. Diseased conditions at or near the surface are easily treated locally by this means. Painful tumors and ulcers in teeth or bone are successfully treated. Many experimenters, however, having nothing to guide them and having little knowledge of the chemical and physiological action of the current, have used the wrong pole, and have made such mistakes in the dosage as either to accomplish nothing or to completely destroy where they attempted to cure. In all work of this kind a milliammeter is almost a necessity.

Foresis has been found of great value in treatment of diseases of the prostate and in the destruction of malignant tumors, both on the surface and deep seated. For the latter purpose salts of mercury are generally used. Dr. Massey has elaborated the technic of the destruction of malignant tumors. He uses for the anode spicules or needles of amalgamated zinc, thru which a relatively strong current is passed under general anesthesia until such time as the hardened tissues become soft. It is found that malignant tissues thus treated are completely killed, and that the tissues immediately surrounding them are sterilized to a depth of half an inch or more by the salts of mercury and zinc. After several days the necrosed tissue comes away, leaving a clean, healthy sore, which soon heals.

The brush discharge from a static machine may also be used for carrying various sets of ions more deeply into the tissues. Tuberculous glands and tuberculosis of any form can be reached to some extent in this way. Recent experiments have shown that high frequency currents of high tension exert a considerable scattering effect upon the ions, distributing them thruout the tissues. The same effect may be produced by x-rays.

In all foric treatment the electrolytic effects of the current which occur at the same time must not be lost sight of. In some cases foresis has received credit to which it was not entitled, for effects due entirely to electrolysis.

American Electro-Medical Society and Illinois State Electro-Medical Society.

First Annual Meeting, Masonic Temple, Chicago, December 1, 2, 3, 1903.

Monday, November 30: 2 p. m., meeting of Executive Council.

Tuesday, December 1: 2-5 p. m., papers and discussion.

Wednesday, December 2: 9 a. m., business session.

Wednesday, December 2: 9:30 a. m.-1 p. m., papers and discussion.

Wednesday, December 2: 2 p. m., business session of Illinois State Society.

Wednesday, December 2: 3 p. m., Executive Council meeting.

Thursday, December 3: 9 a. m.-1 p. m., papers and discussion.

Thursday, December 3: 2 p. m., demonstrations and clinics.

Physicians and others attending the meetings of the society may purchase tickets for the International Live Stock Exposition, which will be held in Chicago November 28 to December 5, and for which round trip tickets will be sold for single fare plus two dollars ($2.00) from points as far east as Buffalo and Pittsburg.

Papers will be presented by Dr. John B. Murphy, Chicago; Dr. G. Betton Massay, Philadelphia; Dr. Byron Robinson, Chicago; Dr. J. Mount Bleyer, New York; Dr. C. S. Neiswanger. Chicago; Hon. John F. Smulski, city attorney for Chicago; Dr. J. Rudis-Jicinsky, Cedar Rapids, Iowa; Dr. H. Preston Pratt, Chicago; Hon. Edward B. Elliott, city electrician for Chicago; Dr. Clarence E. Skinner, New Haven, Conn.; Dr. J. N. Scott, Kansas City, Mo.; Dr. R. S. Gregg, Chicago; Dr. Mihran K. Kassabian, Philadelphia; Dr. T. Proctor Hall, Chicago; Dr. A. D. Rockwell, New York; Dr. Carl Beck, New York; Dr. Heber Robarts, St. Louis, Mo.; Dr. J. B. Pennington, Chicago; Dr. John E. Gilman, Chicago; Dr. Chas. G. Davis, Chicago; Dr. P. C. Clemensen, Chicago; Dr. J. P. Hetherington, Logansport, Ind.; Dr. O. W. McMichael, Chicago; Dr. O. S. Barnum, Los Angeles, Cal.; Dr. Elmore S. Pettyjohn, Chicago; Dr. Geo. F. Hawley, Chicago; Dr. John E. Harper, Chicago; Dr. J. Lloyd Hammond, Chicago; Dr. F. A. Leusman, Chicago; Dr. C. D. Collins, Chicago; Dr. Hamilton Forline, Chicago; Dr. R. H. Bartlett, Chicago; Dr. H. P. Fitzpatrick, Chicago; Dr. S. V. Clevenger, Chicago.

In connection with the meeting there will be an exhibit of electro-therapeutical apparatus.

The following are the members of the Local Committee: Dr. W. K. Harrison, Dr. Chas. P. Donaldson, Dr. Hamilton Forline, Dr. John E. Gilman, Dr. C. D. Collins, Dr. F. A. Leusman, Dr. E. S. Pettyjohn.

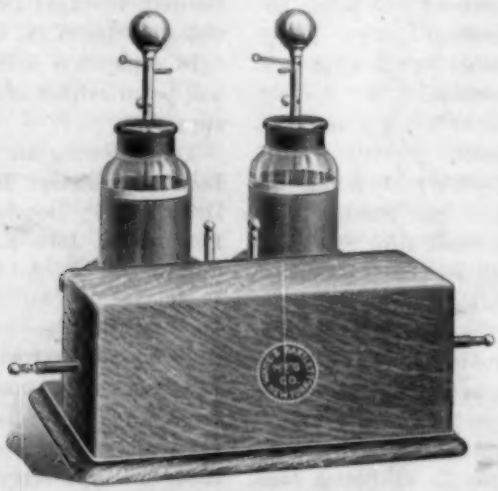
Chicago Electro Medical Society.

At the October meeting of this society Dr. T. P. Hall gave an explanation of the structure and operation of the three kinds of apparatus in common use for obtaining high frequency currents.

A discharge from a Leyden jar, or the discharge between the outer coatings of two Leyden jars when the inner coats are connected to the poles of a static machine or an induction coil, is oscillatory. These oscillations are exceedingly rapid, amounting to tens of thousands and hundreds of thousands per second. The rapidity of oscillation is dependent upon the capacity of the jars and the inductance of the circuit. The oscillations occur after each impulse from the machine, and decrease rapidly in amplitude. This decrease becomes more rapid as greater resistance is put into the circuit, until the

oscillations cease entirely. For this reason the oscillating current from the jars can not be applied directly to the body.

When the connection between the outside coatings of the Leyden jars is made by a heavy copper wire which forms a helix, and this helix is the primary wire of a coreless inductorium, the small resistance of the primary interferes very little with the amplitude of the oscillations, and each oscillation induces a corresponding oscillation in the secondary circuit which may be applied to the body as required. This apparatus is known as



HYPERSTATIC MACHINE.

Piffard's hyperstatic. It was illustrated with a machine kindly loaned by Dr. H. Preston Pratt.

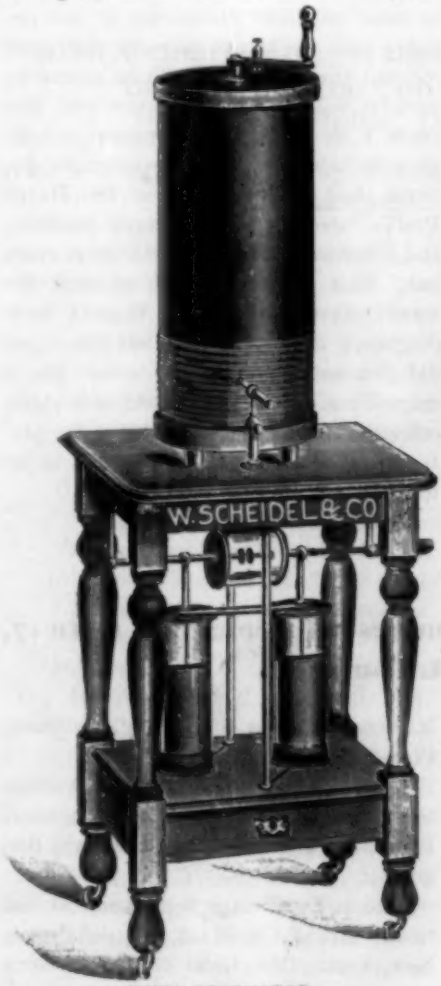
A second device for creating oscillations of very great amplitude is known as the Oudin resonator. In the resonator the primary current from the outer coating of the Leyden jar is conducted thru the lower portion of a coil of heavy copper wire. This starts up oscillations in the large coil and when these are properly attuned to the coil they are much amplified at the free end. This was illustrated by a coil kindly loaned for the purpose by Mr. Scheidel. An arm at the upper end of the coil carries a distributing disk. When two coils are used and the patient placed between these disks a strong oscillating glow passes from the disks to the patient. This form of resonator is exceedingly powerful and is used with good effect in all cases in which hyperstatic currents are indicated.

The third form of apparatus for high frequency currents is the D'Arsonval coil. It consists of a spiral coil which is made a part of the primary circuit from the Leyden jars. The electrodes are attached at each end of this coil. The oscillations obtained thru the electrodes are of much lower potential than those from either the hyperstatic or the Oudin resonator, but in spite of this the current is considerable when the resistance of the electrode-circuit is small. This was also illustrated by a coil from Dr. Pratt's laboratory.

Dr. H. P. Pratt then gave a very full explanation of the physiologic and therapeutic action of high frequency currents, showing wherein they were similar to the alternating and more particularly to the sinusoidal current. Metabolic changes in the tissues are hastened and oxidation

and elimination are both stimulated. Therapeutically these currents have been found very advantageous in most forms of tuberculosis, in skin lesions, and in disturbances of the nervous system.

Several other members of the society took part in the discussion. Dr. Byron



OUDIN RESONATOR.

Robinson then read a paper of which the following is an abstract:

Diagnosis of Ureteral Calculi.

The x-ray has made a new era in the diagnosis of ureteral calculi. Previous to the x-ray there was no pathognomonic symptom. The old classic symptoms of pain or ureteral colic hematuria and the expulsion of a calculus is a medical rarity. The final court of diagnosis of a ureteral calculus is an x-ray. At first the x-ray was uncertain in this diagnosis, but with the improvement of the method it is now a last resort. The x-ray is the sovereign method to detect a ureteral calculus.

There are at present two classes of phy-

D'ARSONVAL SPIRAL.

sicians. The one class claims that a shadow is positive evidence that a calculus is present and that a negative result indicates that a calculus is absent. The second class claims that a negative result does not exclude a calculus.

Dr. Robert S. Gregg and I have proved in Dr. Harry Pratt's laboratory that all isolated crystalized urinary salts when

exposed to the x-ray will cast a shadow of definite contour, density and dimensions. We also demonstrated by exposing some thirty-five urinary calculi expelled by the patient himself, and some twenty ureteral calculi removed surgically, that a shadow of definite contour and dimension was cast in every case. From over five years of painstaking x-ray work we have come to the opinion that every ureteral calculus should cast a shadow. The patient should be on the dorsum with legs flexed on a double adjustable inclined plane, head flexed with sand bags, tractus intestinalis completely evacuated and one-eighth gr. of morphia sulphas administered immediately before the exposure. If this general exposure indicates a shadow it should be confirmed by a special method in which the subject is protected by lead screens, giving concentrations of x-rays for contrast. Experimental labors in the x-ray on ureteral calculus by the above method indicates that every ureteral calculus should cast a shadow. Experiments also demonstrate that the shadow of a ureteral calculus ought to be cast regardless of location, density, composition or condition of the patient. The wonderful progress in the perfection of x-ray technique has enabled the physician to make confident statements to the patients who are becoming more and more relieved from painful condition attending ureteral calculi. During the past five years I have diagnosed ureteral calculi on a definite side in five consecutive patients, had them x-rayed in Dr. Harry Pratt's laboratory and secured shadows, and I removed ureteral calculi from every one. This is an indication of what the x-ray may do. At other times I have diagnosed ureteral calculi but the x-ray did not confirm it. The x-ray has a magnificent future in the field of ureteral calculus. What is now needed is the perfection of the technique and ability to interpret the shadow.

The International Electrical Congress of September 12 to 17, 1904, at St. Louis.

The following appointments have been made by Professor Elihu Thomson, president of the Committee of Organization of the St. Louis International Electrical Congress:

Section A—General theory, mathematical, experimental. Professor E. L. Nichols, chairman, Cornell University; Professor H. T. Barnes, secretary, McGill University.

Section B—General applications. Dr. C. P. Steinmetz, chairman, Schenectady, N. Y.; Professor Samuel Sheldon, secretary, Polytechnic Institute, Brooklyn.

Section C—Electrochemistry. Professor H. S. Carhart, chairman, University of Michigan; Mr. Carl Hering, secretary, Philadelphia.

Section D—Electric power transmission. Mr. Charles F. Scott, chairman, Pittsburg; Dr. Louis Bell, secretary, Boston.

Section E—Electric light and distribution. Mr. J. W. Lieb, Jr., chairman, New York; Mr. Gano S. Dunn, secretary, Ampere, N. J.

Section F—Electric transportation. Dr. Louis Duncan, chairman, Massachusetts Institute of Technology; Mr. A. H. Armstrong, secretary, Schenectady.

Section G—Electric communication. Mr. F. W. Jones, chairman, New York;

Mr. A. B. Gherardi, Jr., secretary, New York.

Section H—Electrotherapeutics. Dr W. J. Morton, chairman, New York; Mr. W. J. Jenks, secretary, New York.

Communications concerning the congress should be addressed to the general secretary, Dr. A. E. Kennelly, Cambridge, Mass.

Fourth Annual Meeting of the American Roentgen Ray Society, to be held at the University of Pennsylvania, Philadelphia, Dec. 9 and 10, 1903.

ARTHUR W. GOODSPEED, PH. D., PRESIDENT. JAMES B. BULLITT, M. D., SECRETARY, 205 WEST BROADWAY, LOUISVILLE, KY.

PRELIMINARY PROGRAM.

1. President's Address, by Prof. Arthur W. Goodspeed, Ph. D., Philadelphia, Pa.
2. Pathologic Changes in Tissue Under the Influence of the X-Ray, by William S. Newcomet, M. D. Philadelphia, Pa.
   Discussion to be opened by Seabury W. Allen, M. D., Boston, Mass.
3. The Results of the Roentgen Method in the Diagnosis of Renal Calculus, by Charles Lester Leonard, M. D., Philadelphia, Pa.
   Discussion to be opened by James B. Bullitt, M. D., Louisville, Ky.
4. Two Cases of Severe X-Ray Necrosis, Presenting Some Unusual Features, by Clarence Edward Skinner, M. D., New Haven, Conn.
   Discussion to be opened by J. N Scott, M. D., Kansas City, Mo.
5. Skiagraphy of the Chest, by Henry Hulst, M. D., Grand Rapids, Mich.
6. How to Obtain an Instantaneous Skiagraph of the Thorax, by Mihran K. Kassabian, M.D., Philadelphia, Pa.
   Discussion upon the above two papers to be opened by Gordon G. Burdick, M. D., Chicago, Ill.
7. The Development of the Skeleton. Radiographically Considered (Lantern Slides), by Preston M. Hickey, M. D., Detroit, Mich.
   Discussion to be opened by G. P. Girdwood, M. D., Montreal Canada.
8. The Therapeutic Effects of the X-Ray, as Shown From the Results of Treatment of One Hundred Cases, by Henry K. Pancost, M. D., Harvey Bartle, M. D., and Mr. Henry C. Welker, Philadelphia, Pa.
   Discussion to be opened by Emil H. Grubbé, M. D., Chicago, Ill.
9. The Roentgen Ray Diagnosis of Obscure Diseases, by Russell H. Boggs, M. D., Pittsburg, Pa.
   Discussion to be opened by J. D Gibson, M. D., Birmingham, Ala
10. Dangers of the X-Ray Operator, by John T. Pitkin, M. D., Buffalo, N. Y.
    Discussion to be opened by Weston A. Price, D. D. S., Cleveland, Ohio.
11. Developers, by Gordon G. Burdick, M. D., Chicago, Ill.
    Discussion to be opened by Mihran K. Kassabian, M. D., Philadelphia, Pa.
12. A Comparative Study of Fractures

of the Extremities, by Martin I. Wilbert, Philadelphia, Pa.

Discussion to be opened by Russell H. Boggs, M. D., Pittsburg, Pa.

13. Technique for Making Good Dental Skiagraphs, by Weston A. Price, D. D. S., Cleveland, Ohio.

Discussion to be opened by Levitt E. Custer, D. D. S., Dayton, Ohio.

14. Care and Use of the Static Machine, by Henry E. Waite, M. D., New York, N. Y.

Discussion to be opened by Walter W. Johnson, M. D., Rochester, N. Y.

15. The Stereoscope in Radiography, by E. W. Caldwell, New York, N. Y.

16. The Influence of the Roentgen Ray Upon the Blood of Normal Individuals (An Experimental Study), by William Krauss, M. D., Memphis, Tenn.

17. Exploding Tubes, by Henry K. Pancoast, Philadelphia, Pa.

18. Treatment of Lupus and Epithelioma by the Combined Use of the X-Ray and Ultra-Violet Light, by J. N. Scott, M. D., Kansas City, Mo.

The sessions will be held in the audience room of Houston Hall of the Houston Club of the University of Pennsylvania. The exhibition of apparatus will be down stairs, in the reading room of the Houston Club.

Under the chairmanship of Dr. P. M. Hickey, of Detroit, Mich., an exhibition of prints is being arranged for, which promises to be a most interesting and instructive display.

A lantern with competent operator will be on hand and ready for use at any time. Those who desire to illustrate remarks need only to bring along the slides.

Arrangements are being perfected for securing from the railroads a fare of one and one-third on the certificate plan. All persons attending the meeting are requested to demand a proper certificate on purchasing ticket, and to turn this certificate over to the secretary at the place of meeting. A fee of twenty-five cents will be charged by the special agent of the railroad for validating the certificate, whereupon the certificate will be good for a return ticket at one-third of the regular fare. This arrangement will obtain only in case there are as many as one hundred tickets bought in this way.

The Normandie Hotel has been designated as official headquarters. It is situated at Thirty-sixth and Chestnut streets, about three blocks from the place of meeting. Hotel rates are, on the European plan, one dollar per day and up; on the American plan, two dollars and fifty cents per day and up.

The exhibition of apparatus will be especially important and interesting, giving the members an opportunity to inspect and familiarize themselves with the improvements and advancements of the past year.

The Diasolenic Bath.

BY OTTO JUETTNER, M. D., M. E., PH. D.

Professor of Principles and Practice of Physiological Therapeutics at the Cincinnati Post-Graduate School of Physiological Therapeutics.

I beg to submit to the readers of the AMERICAN X-RAY JOURNAL and to the electro-therapeutic fraternity at large a preliminary report concerning the technical construction and the therapeutic uses of a novel attachment to the static machine which has recently been extensively used at our school and seems to have much to recommend it. The apparatus consists of a platform, two feet wide and six feet long, and a huge cylinder five feet long and three feet in diameter, which is suspended from a suitable wooden stand and hangs horizontally. The stand also holds the platform which is placed inside of and thru the cylinder which hangs around it without touching it. The platform rests on rollers and can easily be moved in and out. The outside of the cylinder is covered with many hundred feet of thick insulated copper wire. The platform is likewise strung with a dense network of wire. Both cylinder and platform are covered with leather, the whole apparatus presenting a neat and attractive appearance. The free ends of the wire, both on the cylinder and the platform are attached to binding-posts. The appearance of the apparatus is not unlike that of the body-apparatus used for thermo-therapeutic applications.

The current needed for this huge electrical machine is furnished by the Leyden jars of the static machine. The cords are attached to the bases of the jars. The sliding rods are separated sufficiently to give a four or five inch spark-gap. One cord connects the base of one Leyden jar with the binding-post on the platform, the other cord being attached to the base of the other jar and the binding-post on the cylinder. The patient, fully dressed, rests on the platform, the head being comfortably supported by a pillow.

The moment the current is turned on the patient experiences a mild, agreeable thrill which merges into a sense of lightness and buoyancy if the application is continued for ten or fifteen minutes. There is no breeze, no spark, no shock. The only disagreeable feature, if such it may be called, is the noisy discharge between the sliding-rods. The application has superseded many of the static treatments on the insulated platform, and is meeting with increased favor both among the students and the patients at the school. It is, to all intents and purposes, the diasolenic bath, so popular with the French electro-therapeutists. The apparatus is simple in construction and easily manipulated. The greatest point in its favor is the fact that it is an attachment to the static machine and requires no street-current or complicated and expensive generating source.

A visible proof of the electric energy with which the interior of the cylinder is charged, is furnished by a vacuum-electrode held inside of the cylinder by the hand of the operator without any contact or connection with the platform or the sides of the cylinder. The moment the current is turned on, the electrode lights up. The same phenomenon takes place when the electrode is laid upon the patient while the current is passing.

Therapeutically the diasolenic bath represents a stimulant of great virtue. It promotes metabolism, which is shown by the slight diaphoresis usually following the application and by the increase in

appetite and digestive power almost invariably observed in the patients who are subjected to this form of electric treatment. It possesses all the virtue usually attributed to "high frequency" currents. Increased function of the kidneys and bowels has been noticed too frequently to be purely in the nature of a coincidence. It certainly acts favorably upon nerve-function. Its antispasmodic action has been shown by the relief of dyspnea seen in a number of asthmatic and emphysematous cases treated in this way.

The careful record which is kept of these cases will enable me to supplement this preliminary report at some future time.

Vibratory Therapeutics.

BY H. FULLER, M. D.*

The effects of vibratory treatment are found to be both local and systemic: the action set up in the constituent tissues of the parts operated upon serves to elevate the temperature. The vessels dilate, an increased quantity of blood enters them, and the blood current is accelerated. The immediate effect of these changes is to promote the nutritive energy of the tissues subjected to vibration. A general rise of temperature of about one degree has been observed to take place quite uniformly. The body increases in weight; all the organic functions are performed with more energy, and power is gained in every way.

In its several forms, vibration exercises peculiar effects on the nervous system. An inflamed part which can be manipulated only with the lightest movement at first, owing to the pain, becomes rapidly anesthetized until it can be handled with some roughness without arousing painful sensations. When the local condition is that of pain merely, it is remarkable how the acutest suffering is alleviated by persistent oscillations of the lighter kind. Again, the state of spasm of a muscle is relieved and relaxation induced by vibrating the affected muscle. Results such as these are explicable on the theory that the rapid vibration of the cutaneous branches of the nerves has so far lowered their irritability that they cease to receive and transmit painful impressions.

Obstinate wakefulness and nocturnal restlessness are quickly relieved by vibration, especially by short and rapid vibration of the lower extremities. Simple headache, even severe paroxysms of neuralgia, and the spasms of tic douloureaux are often most surprisingly relieved by, at first, exceedingly delicate vibrations of the end-organs of the fifth nerve—the skin of the face, forehead, neck and scalp—and subsequently stronger vibrations of the same parts and upper extremities. This same method has been effective in hemicrania, migraine and spinal pain due to simple anemia of the cord; also in infantile paralysis and other wasting palsies after the acute symptoms have subsided. In hemiplegia and other forms of paralysis due to intra-cranial lesions, the indications for the treatment by vibration are a lowered state of the nutrition of the paralyzed parts, coldness and blueness of the skin, wasting and contracted muscles, ulcerations, etc. In progressive muscular atrophy the treatment should be begun early, and the first indications—pain, fibrillary trembling, weakness, etc.—require vibration without waiting for obvious wasting. The efficacy of this treat-

ment in chronic joint affections, synovitis, contractions and deformities, and thickening from inflammatory deposits, has been repeatedly verified.

Before using the vibration it is often well to localize the patient's painful centers. For this purpose the patient's back is bared, and a high tension faradic coil is brot into use. Before applying this current the coil should be tested with a four to six inch Geissler tube. If the coil is capable of illuminating the tube, then it possesses the proper amount of penetrative power to be useful for our purpose.

One pole of the battery—it matters not which one—is attached to a six by six inch moist electrode and applied in front over the epigastric plexus, the other or smaller electrode, two by two inches, well moistened, is passed lightly over the patient's spinal column, with a current strength sufficient to be agreeably susceptible. Pass this current up and down the entire length of the spinal column with ordinary pressure, eight or ten times, then remove the electrodes, when to our agreeable surprise we have boldly outlined upon a white background vivid red spots. These spots for some few minutes after the current is removed tend to become even more prominent, and more sharply circumscribed. If we now make digital pressure upon any of these indicated points we will find sensitive or painful areas, while no pain will be complained of in the intermediate regions.

These pictures in a short time become practically pathognomonic, so that the pratician can almost make a diagnosis from the reflex centers involved. If we remember the nerve connections just prior to the entrance to or exit from the spinal canal, and bear in mind the effect of irritation upon any tissue, we then have a clear conception of why the sympathetic nervous system responds so readily to our irritation, and also why the more irritated centers (from other causes) should respond before even the normal tissue appreciated the irritation produced by the current.

Having located the reflex centers, we then find whether the distal tissue or organ involved is in a hyperemic or anemic condition. Should we find that somewhere in the body an organ or tissue is swollen and in a state of chronic congestion, our course would be to so influence the sympathetic center by vibration or otherwise that the vascular supply would be limited.

Some idea of the scope of vibratory therapeutics may be gathered by the following summary, quoted from various authorities on the subject of massage in general. Certainly the only reason why physicians have neglected such an important agency in the past must be due not to ignorance or unwillingness, but rather because there has been no adequate instrument, until recently, by which active or passive massage could be administered in the same dignified and scientific manner as one gives electricity.

In diabetes glycosuria is diminished as a result of muscular activity in many cases. There is an undoubted improvement in the circulation, intestinal peristalsis, and self-reliance of the patient. In mild forms the most extensive use of muscular exercise should be made; the severer forms require passive gymnastics and massage.—Carl H. Van Noorden, formerly Professor of Therapeutics, University of Berlin.

Methodical muscular exertion is hardly secondary in importance to the regulation of the diet.—Albe.

Sugar circulating in the blood is destroyed when the muscles are working.

In gout, exercise promotes oxidation and improves excretion. Massage is very useful to counteract the development of

rigidity.—Henry M. Lyman, Professor Medicine, Rush Medical College.

A fit of gout is due to stasis in the capillaries in the affected joint. A threatened attack may be warded off by massage and exercise.—Geo. Balfour.

At the beginning of the century Wm. Balfour, of Edinburgh, had a great reputation for the treatment of rheumatic affections by massage. Occasionally he attacked more acute ailments with a boldness and success which were remarkable. —*Lancet*, Aug. 13, 1899.

In every feasible way joint movement should be maintained by active and passive movements.—*Park's Surgery.*

Nephritis.—In the acute, productive form, daily massage and compression by leg bandages is of real value ofttimes.—Francis Delafield, Professor Medicine, Columbia.

Obesity.—Exercise and massage are correctives by improving the oxygenation of the tissues.—Campbell.

Muscles should be stimulated by exercise in proportion to the existing power. If atheroma has developed, in no case should exercise be altogether dispensed with.—Max J. Oertel, Professor Medicine, University of Munich.

Anemia.—Moderate exercise is an advantage in the treatment which can not be neglected.—Stengel.

Chlorosis.—After the blood begins to improve give massage and passive exercise, then, later, general exercise.—Stengel.

Hypertrophy and Dilatation of the Heart.—Chronic degenerations are best overcome and muscular tissue best developed by systematic exercise. Too much rest favors the processes of degeneration. —James T. Whittaker, Professor Medicine, Ohio Medical College.

Mitral Stenosis.—Systematically develop by cautiously graded exercise.—Whittaker.

Aortic Stenosis.—Excessive rest favors degenerative changes, so give regulated exercises.—Whittaker.

Relieving Disturbances of the Heart.—Exercise must be ensured in order to assist the processes of tissue change. In those unable to rise, massage must be employed along with passive movements of the limbs. In those who are able to go about, active exercise is of the greatest importance, and a progressive increase may be safely recommended.—Geo. A. Gibson, F. R. C. P., Edinburgh.

The exercises and baths of the Schott treatment accomplish the same end, that of drawing the blood from the congested heart, thus giving it time for rest and recuperation.

Massage and passive exercises produce a reflex, calming effect upon the central nervous system, and quicker exchanges and more rapid neutralization of toxins take place in cases where the etiology shows infectious disease.—*Indiana Med. Record.*

Neurasthenia.—Physical exercise is of enormous value. Massage is grateful and helpful to women.—Dana.

The physical influence of rest and massage is often useful on account of the complete repose to the motor nervous system.—Gowers.

Insomnia.—Massage by drawing the blood to the surface of the body, thus tending to render the brain and cord anemic, is often of great value.—Brown.

Locomotor Ataxia.—Gymnastics have a special value as a remedy for the ataxia. Frankel's plan of exercise for the education of the coördinating centers, guarding against the patient's overdoing, is particularly to be recommended. Erb, Raymond, Hirschberg, Goldscheider, Dana, and others follow the principles set forth by Frankel in his method of exercise treatment and report cases of cure.—Möbius.

Frankel reports a case which had been

bed-ridden for several years, walking, with no signs of ataxia, as a result of pursuing his method of treatment.

Cerebral Exercise.—Frankel recommends treating certain motor disturbances, such as paralysis agitans, Sydenham's chorea, convulsive tic, and aphasia, by subjecting the muscles affected to a process of reëducation by means of a series of graduated systematic exercises. —*British Medical Journal.*

Emphysema.—Exercises will help in restoring mobility of the upper part of the chest and in restoring the lost elasticity of the lung.—Kingscote.

Diseases of Women.—Pelvic massage is a rational therapeutic agent, and it is applicable for the relief of many conditions for which there is no other equally good remedy. In the pelvis, as in other regions, it quickens the circulation, prevents stasis in the lymph channels, furthers resorption and retrogressive metamorphosis, gives tone to the muscles, excites muscular activity and so improves the nutrition. Indications are the removal of inflammatory exudates, breaking up and stretching of adhesions, restoration of function to contracted or overstretched ligaments and the reposition of displaced organs under proper precautions.—E. C. Dudley, Professor Gynecology, Northwestern University.

Eye Diseases.—Sueginrew reported favorable results from massage in maculae, keratitis, parenchymatosa, follicular and phlyctenular conjunctivitis, hypopyon, iridocyclitis, traumatic cataract and absolute glaucoma. Katsaura writes that massage reduced intraocular tension even in glaucomatous eyes, and produced especially favorable results in episcleritis

Convalescence.—Celsus advised massage of the whole body when an invalid required his system to be replenished; thus improving and facilitating the nutritive, eliminative and circulatory exchanges so that the system would be restored to a normal condition in much less time than would otherwise be possible. At the same time the increase of the physical tone would lessen the liability to sequelæ or relapses.

Electro Physics.

The Static Machine.

Dr. F. R. Boyd, St. Louis, Mo. (*Med. Brief*, September), describes the care required by a static machine in order to produce the best results in x-ray and electro-therapeutic work. The insulated stand must have legs at least one foot long. Everything about the machine must be kept dry and clean. For drying purposes calcium chlorid is good if pure, but it must never be put in the case until it has had ample time to cool after baking, otherwise the metal parts of the machine will be corroded. Those who fail to obtain good results from the static machine will surely find that the fault lies in defective technic.

A Novel Electrolyte for the Wehnelt Interruptor.—In a note recently read by D. E. Hauser before the Spanish Physical and Chemical Society, the drawbacks to the use of sulphuric solution in connection with the Wehnelt interruptor were pointed out—viz., first, the necessity of relatively high voltages, and, second, the comparatively high currents traversing the primary of the Ruhmkorff coil according to the great value of the voltage. The process suggested by the author con-

sists in using an electrolyte which, under otherwise equal conditions, gives rise to an increase in the number of interruptions of the current traversing the primary coil, and hence to an increase in the inductive resistance, this increase resulting in the intensity of the current in the primary being diminished without inefficient absorption of energy. The electrolyte that best fulfils this condition is a half-saturated solution of magnesium sulphate, slightly acidulated with sulphuric acid; this electrolyte, though exhibiting a considerable conductivity, is not corrosive, and allows of starting the operation at a much lower voltage, altho it works perfectly well as far as 118 volts.—*Electricity.*

Electric Filtration.—J. W. Frazier, of Alleghany, Pa., is the patentee of a system of filtration in which strong electric currents are used to precipitate the impurities in the water. He says that in this way all organic matter and disease germs in the water supply of cities can be removed, and that if it is admitted that filtration by the sand or by the mechanical method destroys a large proportion of the impurities and thus reduces the death rate from typhoid fever, a complete purification of the water will accomplish much better results. Mr. Frazier says: "My process is based upon the principles that electricity, and ozone which is set free by the electric current, burn all organic matter in the water, including bacteria and their vital products. Electricity and ozone oxidizes not only the bacteria, but all organic matter. The water is rendered colorless, sparkling and odorless."—*Electricity.*

Aluminum Conductors for Electric Transmission Lines.

Mr. Alton D. Adams discusses briefly the relative advantages of the two metals, aluminum and copper. Comparing wires of equal sizes and lengths, the aluminum has only sixty per cent of the conductivity of copper. Therefore, to secure an equal conductance aluminum wire must have a diameter twenty-eight per cent greater than that of copper. Since copper is 3.33 times as heavy as aluminum, for equal weights the latter has 3.33 times the bulk of the former and a conductance twice as great. The tensile strength of both copper and aluminum wire is about 33,000 pounds per square inch of section, so that for wires of equal length and resistance, the aluminum is sixty-six per cent stronger. Medium hard-drawn copper has a tensile strength of about 45,000 pounds per square inch, so that for equal resistance the aluminum wire still has the advantage. This alone would allow the poles, cross-arms and pins of the transmission line to be lighter or to be spaced further apart, but, on the other hand, the strain due to the wind would be greater with the large aluminum wire. As the surface of the wire may be no greater than that of the poles, the increased wind strain may not be as great as the increased surface of the wire. Aluminum has a greater coefficient of expansion, and for this reason must be strung with a greater sag, but this greater sag avoids much of the vibration of the wires which is produced by the wind if they are more tightly strung. Aluminum expands between 32 and 212 degrees F. about 0.0022 per cent; copper, under the same conditions, 0.0016 per cent. The larger diameter of the aluminum wire over an equivalent of copper has an additional advantage in that the inductance varies inversely to the diameter of the conductor employed, and the silent discharge from wire to wire is also less with larger wires.—*Electr. Rev.*

Powerful Electromagnets.

New forms of electromagnets have been devised by MM. Camacho and de Mare, and are here described by M. E. Guarini. Camacho's magnet consists of a number of separately wound iron cylinders which slide one into the other. The different windings may be connected up in a variety of ways. When assembled, the various tubes of the electromagnet have the same polarity at corresponding ends. Similar in conception, but of greater power, is the magnet invented by M. de Mare. In this the poles are slotted and concentric coils wound in the various slots. Figures obtained by means of iron filings with an ordinary electromagnet and that of de Mare show a much more even distribution of magnetic lines with the latter, and a table of comparative data is given, showing that with an ordinary wound magnet and one constructed by de Mare, each weighing about one kilogram and containing equal weights of equal copper wire, for the same amount of electrical energy consumed, the carrying capacity, as measured by the author, was one kilogram for the ordinary magnet and nine and six-tenths kilograms for the de Mare.—*Electr. Rev.*

Asymmetry of a Mercury Break.

In making some experiments to determine the law governing the capacity of the shunted condenser necessary to stop the sparking at the break of an inductive circuit, Mr. James Edward Ives discovered that the necessary capacity varied according to the direction of the current. This phenomenon was so marked that he undertook further experiments to confirm it. The interrupter used when the action was noticed was an ordinary mercury break covered with acidulated water, contact being made with the mercury by means of an amalgamated copper wire. It was found that the action was not due to the acidulated water, nor to the metal of the contact wire, as the reaction took place with and without the water and with iron and platinum wires. It was also found that the effect was not due to the fact that in the ordinary mercury break the spark passes between a point and a plane, for by making a contact between a wire and a thread of mercury in a capillary tube, the same action resulted. It is suggested that the asymmetry may be due to some selective action of the mercury vapor generated when the spark passes, of the same nature as the Cooper Hewitt effect, or it may be due to some capacity effect such as is found in the Wehnelt interrupter.—*Electr. Rev.*

Magnetic Rocks.

Note is made in the English papers of the discovery of a considerable stretch of magnetic rocks off the coast of Alaska, where compasses have been inclined to go wrong. It is remarked, however, that Alaska has no monopoly in magnetic rocks that distress the mariner and surveyor. Not long ago a party of Russian explorers found their needle swing round 180 degrees. Parry, in his second voyage in the Fury and Hecla, observed a considerable local deviation of the compass when off the shore of Igloolik. At Bluff Harbor, South Island, New Zealand, there is a focus of magnetism on the summit of the bluff; and during the survey of South Island the officers of H. M. S. Acheron had to abandon the use of compass bearings. A similar disturbance was observed by Captain Creak when surveying near Port Walcott, Northwest Australia. He came across a submerged square mile of rock, which made the needle of his compass hop about fifty degrees and more from where it should have been. Upon the Norwegian coast in the Joedern province is a magnetic mountain, about a

thousand yards long, but of no great height. Its influence is such that vessels venturing too near the coast lose their bearings, and some are wrecked.—*El. World and Eng.*

Contact Voltages.

A recent issue of *L'Eclairage Electrique* contains an article giving the results of an investigation upon the influence which the degrees of polish and the superficial densities of bodies have on the difference of electrical potential produced by their contact. The following conclusions are given: Of two surfaces of a particular metal, that which is most polished always becomes positive. When two different dielectrics are brought into contact, the hardest one ordinarily becomes positive. The contrary takes place with metals When a hard material presents, on account of its structure, few points where contact is possible, it behaves like a soft substance. Glass wool becomes negative in contact with cloth, porcelain and glass. Hygroscopic surfaces, when poorly dried, behave like water. A body which easily crumbles into dust, or a glue-like body which leaves traces on the surface with which it is in contact, becomes negative. Thus, ebonite becomes negative when in contact with emery paper, but it is positive when it is rubbed with a paper in order to polish it. Two pieces of quartz, sugar or pyrite, which give a phosphorescent light when knocked together, are both positively electrified. The particles produced by knocking are, on the contrary, negatively charged.—*El. Rev.*

The Effect of Radium on the Conductivity of Liquids.—An interesting, and what may prove to be an important scientific announcement, was made recently by Professor Friedrich Kohlrausch, in regard to the action of radium rays in increasing the electrical conductivity of water. Experiments were carried out with rays which were emitted by bromid of radium and barium, and which, after passing through an aluminum screen, were sent through a layer of water. After an exposure of some time, it was observed that the conductivity of the water increased.—*Electric Rev.*

Radium and Radial Energy.

The *Eclectic Med. Jour.* for September, comments editorially (*J. U. L.*) upon the absurdity of attributing to atomic explosions the energy from radium, and points out that the simplest explanation of the phenomena lies in the assumption that radium transforms invisible ether waves into visible forms of energy. The same position was taken not long ago by Lord Kelvin, and is undoubtedly correct.

Measurements of Radioactivity.

A paper read by Mr. Hammer in April before the American Institute of Electrical Engineers and the American Electrochemical Society, which in part treated of radium, this explanation appears:

To measure radioactivity, Prof. and Mme. Curie measure the electric conductivity which a radioactive substance imparts to air, and take as unit the radioactivity of uranium. The radioactive substance is placed on one of two condenser plates, which are charged to a high potential. The air between the condenser plates is rendered a conductor of electricity by the presence of the radioactive substance, and in a certain time a certain quantity of electricity will pass from this condenser plate to the other plate. This quantity of electricity passing over in a certain time is determined and serves as a measurement of radioactivity. If the quantity of electricity passing from one plate to the other in a certain time is x times the quantity which would pass in the same time if uranium was substituted

for the tested radioactive substance, it is said that the latter has the radioactivity x. The problem is, therefore, to measure the quantity of electricity passing from the one condenser plate to the other in a certain time. This may be done in two essentially different ways. Either by an electrometer method the quantity of electricity may be measured which during a given time passes over to the previously uncharged condenser plate. Or the time may be measured in which this plate when connected to an original charged gold-leaf electroscope discharges it. . For these latter measurements the gold-leaf electroscope may be observed by means of a telescope provided with a micrometer scale and the time taken for the discharge of the electroscope is taken by the means of a chronometer. By such methods, the Curies say, according to Mr. Hammer, that they can detect the presence of a radioactive substance by the means of such a minute quantity that it would require 5,000 times this amount to show at all in the spectroscope. And it is stated that this method of electrical analysis is thousands of times more sensitive than spectrum analysis and millions of times more sensitive than chemical analysis.—*El. World and Eng.*

New Form of Photo-Telegraph.

Professor Korn, of Munich, Germany, has devised a new system of photographing by telegraph. This system depends on the property of selenium, which has the characteristic of being a poor conductor in the dark, but becoming a good conductor when exposed to the light, the degree of resistance varying according to the amount of illumination to which the selenium is subjected. The apparatus at the sending station consists of a hollow glass cylinder which turns on its axis while moving parallel to the direction of this axis. On this transparent cylinder a photographic negative film is fastened The rays of light emitted by the source are condensed by a lens on the point of the negative which they traverse and then strike the selenium battery placed in the interior of the cylinder. An electric current passing thru the selenium, whose conductivity changes at each instant under the action of the more or less intense light that it receives, passes over the line to the receiving station. At this point the current passes thru a D'Arsonval galvanometer with a light aluminum needle to a vacuum tube similar to the Geissler tube, entirely blackened save at the lower extremity, where there is a little aperture situated close above a revolving cylinder covered with a sensitive photographic film. When the galvanometer needle moves under the action of the current transmitted by the line, the curved ends of the needle approach to or recede from a metallic piece which causes currents of high frequency to illumine the interior of the vacuum tube. The light rays escape through the orifice, and the photograph is thus reproduced, point by point, as a positive image.—*Electr. Rev.*

Nomenclature.

In his presidential address at the meeting of the American Electro-Therapeutic Association in September Dr. Brower said the time has come to drop the terms galvanism, faradism and franklinism, and to replace them by scientific terms which are acceptable to electricians generally. The suggestion is a good one.

Finsen Treatment.

The *St. Louis Med. Era* for October, 1903, gives editorially a description of this treatment and states some of its advantages.

Electro-Therapy.

Electric Shock.

In a paper read before the Verein Deutscher Revisionsingenieure, Dr. Kath treated of the conditions of the safety of the men driving electrical plants. Direct current, he pointed out, will, as a rule, become really dangerous only in the case of several unlucky circumstances being present at the same time, as its tension seldom exceeds 500 volts. Direct-current machines should be enclosed tightly, so that sparking, liable to endanger the surrounding medium, is prevented. As regards the properties of the human body, the author draws attention to the fact that an electric shock will essentially act on the nervous system, as the nervous substance is a conductor of electricity surrounded by less conductive fat and muscle substance. The paths most frequently followed by the current in the case of accidents will afford an evidence as to which nerve strings are most likely to be struck, which functions most liable to be paralyzed, as being controlled by the nerves. In the case of the shock entering by a hand or the head and leaving by the other hand or a foot, the nerve descending from the neck and leading to the lungs and heart—the so-called *nervus vagus*—will be struck, and as the latter regulates both the respiration and the action of the heart, respiration will first be stopped, and the action of the heart will eventually cease in the graver cases. A shock entering by the points of the fingers and leaving by the upper arm, however, will, as a rule, not be attended by fatal results, the above nerve not lying on its way. The best assistance in the case of an accident will be rendered in the way of producing artificial respiration, enforcing the heart action and diminishing the pressure of blood, the latter being obtained by injecting one to three drops of amyl nitrate. The dangers of electric currents will, moreover, vary to a high degree according to personal predisposition, persons subject to alcoholism, as well as those easily frightened, suffering much more from the effect of electric shock than normal people. The limit of danger is considered as coinciding with 0.1 ampere.—*Electr. Rev.*

The Faradic Current in the Treatment of Alopecia Areata.—Ehrmann at a session of the Vienna Dermatological Society, exhibited a young man suffering from complete alopecia lasting from his fourteenth to his twentieth year, who had been treated with the faradic current. The treatment was carried out by the patient himself, and at the end of six months there was complete restoration of the hair. Ehrmann has frequently seen areas which had been purposely left untreated, remain hairless, while those to which the current had been applied showed growth of hair. He regards this as conclusively demonstrating the curative influence of this method of treatment.—*Am. Med.*

A New Treatment for Wry Neck.

Dr. L. K. Hishberg, Baltimore (*Md. Med. Jour.*, October, 1903), claims remarkable success in the treatment of wry neck by stimulation of the corresponding muscles on the unaffected side. In many cases the torticollis seems to originate in weakness of the opposing muscles. The stimulation is brought about by placing one electrode at the wrist or other indifferent part, and moving the other electrode over the muscles of the unaffected side, with a faradic current. Treatments are given five minutes daily for from three weeks to several months.

Hyperchlorhydria Treated by High Frequency Currents.

Dr. Geo. Kerschill, London, England (*Int. Med. Mag.*, June), gives a detailed description of his high frequency apparatus and the various electrodes used in connection with it. For this disorder he applies the electrodes (1) one upon the tongue and one upon the epigastrium, in order to get as great action as possible in the stomach; (2) one upon the rectum and one upon the epigastrium, thus confining the current as much as possible to the intestines; (3) one within the rectum and one upon the tongue, for passing the current thru the whole intestinal tract. The electrode must be placed in position before the machinery is started, otherwise there will be painful shocks. The same precaution must be observed upon their removal.

Those cases in which the disorder is due to acute glandular gastritis are aggravated by a high frequency current.

Chronic Catarrhal Deafness.

Dr. Hopkins (*Med. News*, August 22) says: "If the tubal obstruction be of long standing it may be necessary to resort to mechanical dilation, many employing Eustachian bougies having their tips covered with cotton for this purpose. A far better method, in skilled hands, consists of electrolysis. Dench's gold electrode, properly applied, rapidly removes tubal obstruction of long standing, but its skillful employment requires a thoro knowledge of electrotherapeutic principles. Indeed, a very excellent aurist may make a miserable failure of the operation if his training in electrotherapeutics be deficient, while on the other hand a very ordinary aurist who is skillful in the use of electricity will secure results which can not be obtained in any other known way. To such a one the operation is reasonably simple, safe and certain. Several precautions must be observed in its employment, *i. e.*; (*a*) Neither heavy nor uncertain currents should ever be employed; (*b*) perfect current control (preferably by a shunt circuit rheostat) is absolutely imperative; (*c*)the current employed should not be of less electromotive force than thirty or more than thirty-five volts; (*d*) the current strength should never exceed one and a half milliamperes at the beginning or five milliamperes at the end of a treatment, and the latter amperage should be very slowly approached. Many cases require no more than four milliamperes; (*e*)treatment should never be given less than three days apart; (*f*) force should never be employed; (*g*) reliance should be placed upon a number of light treatments rather than upon a few heavy ones; (*h*) polarity of current should never be in doubt.

These points, carefully observed, remove every element of danger from the operation and leave the opponents of the the operation without any ground upon which to base their opposition. Skilled operators have obtained brilliant results in a large number of these cases, and such operators will continue to get such results regardless of any criticism which may come from those who are less skilled in applying this particular form of treatment.

If the treatment be employed with reasonable skill and with due observance of the precautions mentioned the several cases of failure will be eliminated. There can not be much pain if the voltage and current strength are properly controlled and all necessary changes of current-strength slowly and carefully made. There can be no reformation of stricture as a result of treatment unless the current be excessive, of wrong polarity or applied too frequently. There can be no formation of a fistula unless the operator forgets

the anatomy of the parts, and only then, ordinarily, by the employment of excessive current or undue force. Properly employed, this treatment causes the stricture to fairly melt away beneath the slowly advancing electrode until the tip of the electrode is felt slipping into the space beyond the stricture. This method is probably the best one ever devised for such cases of catarrhal deafness as are entirely due to occlusion of the eustachian tube.

A nice modification of this treatment consists of using a kataforic electrode at the anode or indifferent pole, saturating it with a suitable iodin or ichthyol solution (iodin vasogen or ichthyol vasogen being sometimes preferred), and holding it against the membrani tympani during each electrolytic operation.

During the past few months experiments have been conducted by the writer with a kind of "electric douche" which has been applied to the entire intratympanic cavity, and while it is rather early to report results, yet there is already much evidence to indicate that possibly, when fairly perfect appliances have been secured and a better technic acquired, katelectrolysis may be made to act as faforably upon old organized inflammatory deposits in the ear as it does upon similar deposits elsewhere, softening them and stimulating their absorption, in which event it will perhaps equal in importance the superheated air method, though it will doubtless require some years of work and experience to bring it to the same degree of perfection.

The promptness with which relief follows this electrolytic-kataforic application is sometimes remarkable.

Iodin kataforesis is a valuable adjuvant in certain selected cases, the auditory canal being filled with iodin solution and a kataforic electrode applied, anode direct, to the tympanum."

High Frequency Currents.

Dr. Henry G. Piffard, of New York, in the *Med. Record*, October 31, has an excellent paper upon this subject. He defines a high frequency current as one which alternates or oscillates at the rate of a million times or more per second, tho he would prefer to restrict the term to the currents produced by modifications of Tesla apparatus. Under high frequency currents he includes Morton's "wave current," which is obtained directly from the outer coating of the Leyden jars, tho he admits some doubt as to the propriety of this classification. Dr. Piffard is well known as the designer of the hyperstatic machine in which the high frequency oscillations are induced in a coil of fine wire which is separated by glass insulation from a few turns of coarse wire whose extremities are in direct communication with the outer coats of the Leyden jars. The current from a hyperstatic has high voltage and less amperage, he states, when excited by a static machine than when excited by a coil. D'Arsonval's condenser is briefly described, and also (which the author considers much more valuable) his larger solenoid. The latter is thirty inches in diameter and six feet high. Its terminals are connected (1) with the terminals of a small solenoid like that in a hyperstatic, or else either (1) the whole or (2) a relatively small part of the large solenoid is put into the direct circuit between the outer coatings of the jars. In the first cases the oscillations of the Leyden jar circuit are simply extended thru the large solenoid. In the second place a part of the solenoid receives these oscillations directly, and if properly tuned as to length, capacity and inductance, the remainder of the solenoid contains greatly amplified electric oscillations—becoming in effect a large Oudin resonator. Dr. Piffard has designed a small spiral for use with the

static machine, from which an oscillating current of low voltage is obtained. The details of its construction are not given.

Dr. Piffard recognizes a marked difference in the effects of the high frequency current and Morton's "wave current," as indeed we should expect from the difference in their character. The magnitude of the high frequency current obtained in the large solenoid is shown by the fact that when the inner terminal of the filament in an incandescent lamp is placed in contact with the coil, and the outer terminal held in the hand of a patient who is within the excited coil, the filament of the lamp is brot to a red or even white heat.

In discussion Dr. A. D. Rockwell said he was somewhat perplexed at the excessive amperage claimed for these high frequency currents and was inclined to think that it is insignificant instead of being 100 or 200 ma., as is sometimes claimed. Prof. Sheldon, of the Brooklyn Polytechnic, said he had measured the high frequency currents passing thru his body with an ammeter of the Stanley type and had obtained a reading as high as 300 ma. Personally he was unable to stand twenty ma. of an ordinary current. Dr. C. E. Skinner, New Haven, approved Dr. Piffard's opinions as to the therapeutic uses of these currents. Dr. W. J. Herdman, of Ann Arbor, said that fully 80 per cent of what could be accomplished by drug medicine could be equally well accomplished by electric treatment. The best eliminant is a high-frequency, high-tension current. These increase the output of uric acid and carbon dioxid and increase the tonicity of the blood vessels. It is unfortunate that physicians are so little acquainted with this wonderful agent. Dr. Jos. Collins regretted that his experience with electricity of various forms, both high and low potential, had been very unsatisfactory. He had not found it as valuable as, for example, massage, and he declared that with a fairly extensive knowledge of electricity he was justified in stating that it is not of signal value in therapeutics.

The Treatment of Cancer by Electric Osmose.

An interesting article by Mr. Wright, F. R. C. S., on the treatment of cancer and other forms of malignant disease appears in the *Lancet*, September 12. Drugs were introduced into the tissues of the diseased part by electric osmose produced by a high frequency alternating current. Leduc has proved by means of colored ions—a solution of permanganate of potash—that the medicaments introduced by electric osmose do not merely pass into the subcutaneous areolar tissue, but directly penetrate into glandular organs and other structures more deeply situated. Frankenhaüser has shown that the amount of medicament absorbed and the depth to which it penetrates have a constant relation, the former to the quantity and the latter to the intensity of the current employed. This process is evidently a very effective means of bringing drugs directly into contact with diseased parts not too deeply seated. In 22 per cent of the cases of cancer treated by Mr. Wright the treatment was successful. He has personally come to the conclusion that "a radio-active salt of strontium introduced into the tissues by kataphoresis by high frequency, will prove the desired panacea of all forms of malignant disease." —*London Elec. Rev.*

Electrolytic Treatment of Ozena.

Dr. L. Rethi (*Allgemein Weiner med. Zeitung*, No. 27, July 6, 1903) has obtained good results by the use of the galvanic current. A copper needle anode is thrust into the middle turbinal. The ka-

thode which is sheathed with platinum is applied to the lower and anterior part of the septum on the same side, and a current of five to ten ma. is turned on for as many minutes. In some cases two or three treatments are sufficient. Disease of the sinuses when present requires especial treatment.

The Faradic Current for Herpes Zoster.

Dr. E. M. Shaw, Cameron, Tex. (*Texas Med. News*, August), reports the cure of a number of cases by the faradic current. Apply one pole over the origin of the affected nerves along the spine, and move the other around and on all sides of the vesical patches and directly over the vesical tissues. Relief from pain is immediate and a complete cure results after a few treatments. Equally satisfactory results are obtained in herpes facialis or fever blisters.

Aneurism of the Left Subclavian Artery Treated by Wiring.

Dr. Judson Dallard, of Philadelphia, reported this case at the Medical Society of Pennsylvania, September 23. Twenty feet of gold and platinum wire were introduced and the current passed thru for some time. The patient died twenty days afterward. Autopsy showed a clot which had formed about the wire, but this had not prevented increase in the size of the sack.

High Frequency Currents for Constipation.

Dr. W. H. Dieffenbach, of New York (*N. Amer. Jour. Homeopathy*, October, 1903), treats the patient with a glass vacuum electrode for the rectum, extending past the sphincter. The electrode is then connected with a hyperstatic machine. Treatment is given for fifteen minutes daily at first; later tri-weekly or bi-weekly. Ordinary medical treatment was given as indicated except in the first case in which no medicine whatever was employed and which was cured in ten treatments. This case was of thirty years' standing, with history of constant drugging. The grooved electrode is preferred. Hemorrhoids if present become reduced in size and gradually disappear.

Dr. Dieffenbach tabulates the various agents entering into the treatment as follows:

(1) Suggestion: While the current is passing and the patient is resting quietly the operator gives instruction regarding regularity of habits, drinking abundantly of water, use of laxative fruits, physical exercise, bath and other points; and the daily repetition of these suggestions create firmly fixed thots in the patient which are not easily forgotten.

(2) Stimulation of the regular circulation.

(3) Dilation of the anus, rectum and the sphincters. This process is gradual and absolutely painless, as the current is analgesic; over-dilatation must be avoided.

(4) Removal of the primary cause; hepatic disturbances, hemorrhoids, atony of the intestines, etc.

(5) Regulation of habits.

One hundred per cent of cures is claimed. Treatment must not be given too near the menstrual period, as the stimulation will bring on premature flow. This treatment is therefore valuable in delayed menstruation.

Roentgen and Finsen Lights, Electrolysis, Etc.

Dr. Sinclair Tousey, of New York (*Medical Record*, October 24), describes a practicable office outfit for the general surgeon, commencing with the wires from the street and ending with the apparatus for ultra violet rays.

Extraction of Needle by the Giant Magnet.

Drs. H. G. Wetherhill and Cuthbert Powell, of Denver, Colo. (*Amer. Jour. Surg. and Gyn.*, October), extracted with the giant magnet two needles, which were first located by the x-rays by Dr. G. Stevens. The core of the magnet is four inches in diameter, the coil ten, the weight 108 pounds, the attractive force 150 pounds per square inch of contact. Attempts had been made to extract the needles by incision but without success. One was in the foot, three-fourths of an inch below the surface. It was exposed to the magnet forty-five minutes the foot being moved slightly in different directions during this time. Then a slight bulging was noticed in the skin. This was incised and the needle immediately jumped thru the opening.

The second case was similar but required an hour's exposure to the magnet.

Prostatectomy and Bottini's Operation.

Dr. Willy Meyer, New York (*Maryland Recorder*, October 24), discusses at length the relative value of the two operations. Concludes that they are supplementary modes of treating enlarged prostate, and not competitive. The operation to be chosen in any case must depend upon the individual and social conditions.

X-Ray Diagnosis.

X-Ray Photographs of Renal and Biliary Stones—All stones of the kidney and ureter give good x-ray pictures, no matter what their composition. Treplin (Meeting of German Surgical Society, Berlin) has not, however, had the same success with gall-stones on account of their softness and their unfavorable position. Stones in the gall-bladder are especially unsuited, since the bile itself will throw a shadow. Stones in the cysticus and choledochus may give good pictures if the patient is not too stout.—*Med. News.*

X-Rays in Spinal Cord Lesions.

In an inspiring article by E. von Leyden and E. Grumach (*Archiv für Psychiatrie und Nervenkrankheiten*, 37. Bd. 1. Heft) the authors describe their use of x-rays for the diagnosing of diseases of the spinal column and of the cord.

By the series of illustrations appended to the article it is particularly noteworthy how comparatively transparent the cord is. The authors refer to thirty cases in which the Roentgen rays were used for diagnosis. In twelve the rays confirmed the previous diagnosis but for the other eighteen patients a new or at least a larger picture was presented to view. In ten of these patients the disorder of the spinal cord was secondary to an affection of the bony column. In one of these there was found compression of the spinal cord in the dorsal region by a tuberculous bony process.

As a diagnosis of myelitis of syphilitic origin had been made in this case and the antisyphilitic treatment begun the change in treatment brought about by the change in diagnosis was both instructive to the physician and beneficial to the patient. The history of this case is of interest and was briefly as follows: A twenty-six year old woman, married, in previous good health, began to suffer a year and a half previously with tingling and increasing weakness in both legs. Six months later there developed twitching and clonic spasms of both legs and at times incontinence of urine. The physi-

cal examination showed total spastic paralysis in both legs in a well-nourished woman; at times clonic contractions in the hip and knee-joint on both sides. The sensibility was undisturbed. On both sides knee and foot clonus was present and Babinski was positive. Incontinence of urine also present. At no place on the spinal column was there pain either subjectively or on firm pressure. The absence of pain on pressure over the vertical axis led to an error in diagnosis, as the Roentgen rays showed a curious disturbance of bone with attempts at callous formation.

In another case there was compression of the dorsal cord. The diagnosis had been made of tuberculous spondylosis with subsequent compression of the cord. Two cases were diagnosed as spondylosis ossificans, or spondylosis rhizomelique, as some prefer to call it. Two cases were tumors; one a carcinoma, the other a sarcoma. Two others were myelitis of the cervical region from fracture, and the last of the series was one in which a diagnosis of bulbar paralysis had been made and a depression localized to the third and fourth cervical spinal process could be made out, but the application of the Roentgen rays showed clearly a disturbance of the third and fourth cervical vertebra. A glance at the eight cases in which affections of the nervous structure was primary shows seven diagnosed as osteoporosis by the Roentgen rays and one as osteoarthropathy. Proper treatment was at once begun in all of these cases and later exposure to the rays showed reduction of the bony formation and a consequent gain in health on the part of the patient.

We are perhaps not looking too far afield when we say the time has almost come when the neurologist will not be satisfied with his examination of the spinal column unless there be added Roentgen ray pictures of the part in all its details.—*Ed. Medical News.*

Radio-Therapy.

Radium.

Dr. Margaret A. Cleaves, of New York, in a paper read at the meeting of American Electro Therapeutic Association and published in the *Advanced Therapeutics* for November, reviews the discovery of the radio activity of metals and discusses the different kinds of rays (alpha, beta and gamma rays) which are obtained from them. The theory of electrons is briefly stated. The physiological effects of radium are also stated. Prof. Hammer placed six tubes of radium on the back of an electric torpedo (fish) for twenty minutes, and temporarily destroyed its power to give shocks. Prof. Curie found that a few milligrams of radium placed under the skin of a mouse over the vertebral column caused death by paralysis in a few hours, and similar effects were produced upon a guinea pig after several hours by tubes of radium in contact with the back of the neck.

Dermatitis follows a brief application of a radium tube to the skin of man and animals and ulceration follows lengthened exposure; but the intestines and serous surfaces are but little affected by it. Salts of radium dissolved in water emit rays which prevent the development of anthrax bacilli.

Germs of micrococcus prodigiosus were killed by exposure to radium rays for three hours. The sensation of light is noticed when a radium tube is held close to the eye or the temple. Prof. Curie

says he would not dare to enter a room containing a kilogram of pure radium, as it would burn the eyes, destroy the eyesight, and probably kill him.

A number of therapeutic results have been reported, one case of lupus exposed to radium thirty-six hours, cured. A case of melanosarcoma, cured. A recurrent epithelioma which x-rays failed to cure was exposed to radium four times, fifteen minutes each, at intervals of a few days. In three weeks healing was established, and with two additional applications a cure was completed in six weeks.

Dr. Cleaves has treated a sarcoma of the cheek and jaw and an inoperable pelvic case of epithelioma, and in both these cases there has been marked improvement. The value of the radium tube used in these cases is about $200.

Roentgen Rays as a Palliative in Cancer.

Dr. C. L. Leonard (*Med. Soc. of Pa.*) in operable cases removes all diseased tissue then uses x-rays. In all inoperable cases x-rays are advised, and the maximum dose which can be borne by the surrounding tissue must be given at once.

Report of the Cancer Committee of the British Medical Association.

One of the most important parts of the report is that dealing with therapeutics, the results of the Finsen light treatment, high-frequency currents and x-rays—methods somewhat oddly grouped together under the head of electro-therapeutics—have been the subjects of inquiries directed to those in charge of special departments at hospitals. Reports of some 400 cases have been submitted for the consideration of the Cancer Research Committee. The results of the treatment of rodent ulcer by means of x-rays are confirmatory of previous experiences. It is said that recurrence occurs in from 20 to 40 per cent of the cases, but are as a rule as amenable to treatment as the primary disease. Complete healing was obtained in 141 out of 216 cases, of which detailed reports were sent to the committee. This gives a proportion of 65 per cent of successes It is pointed out that as the majority of cases were inoperable or had already been treated by the knife and had recurred, this high percentage is very satisfactory. Of the remaining cases, improvement was recorded in forty-three, no benefit resulted in sixteen, while in three instances the disease was aggravated. With regard to other forms of malignant growth, the committee state categorically: "The results so far brought to our notice do not establish the efficiency of any of these measures as curative measures in sarcoma and carcinoma."—*Med. News,* August.

X-Ray in Malignant Disease.

Dr. G. G. Burdick (*Medical Brief,* November) calls attention to the unreasonable opposition to x-ray treatment on the part of many surgeons who know little or nothing of this matter. He knows of about 200 cases of internal and breast cancers which have remained cured by x-ray treatment for more than two years. In numberless other cases a complete cure can not be claimed but the improvement in the condition of the patient has been so marked that the ordinary affairs of life can be attended to with comfort and pleasure. In advanced cancer involving the intestines, it is dangerous to push the treatment so far as to destroy all cancerous tissues. If this is done perforation usually follows. For skin cancers of all kinds the x-ray is specific. About 80 per cent of cancers within one inch of the surface can be easily cured. Even when far advanced a cancerous growth within the body can be checked and held indefinitely.

Radio-Therapy in Rectal Disease.

Dr. Sinclair Tousey (*Medical Brief*, November) says that ulcers of the rectum which do not respond to ordinary treatment can be cured by the use of the high frequency current. He uses a rectal vacuum tube connected directly with one terminal of the secondary circuit of an x-ray coil keeping the discharges about four inches apart. The patient must be insulated during this treatment to avoid unpleasant shocks.

Rectal ulcers which have been operated upon by dilating the sphincters and using the cautery heal very slowly. These Dr. Tousey treats with a copper kathode placed in the rectum and a sponge held in the patient's hand, or against the abdomen. Fifteen or twenty ma. are passed for from ten to twenty minutes, daily.

Pruritis ani, along with its accompanying headaches and neuralgias is relieved by the vacuum electrode treatment. Anal fissures and atonic conditions of the rectum and sigmoid flexure yield readily to the application of the vacuum electrodes.

Roentgen Rays in Therapeutics,

Dr. Mihran K. Kassabian, of Philadelphia, at the Medical Society of Pennsylvania, compared the results of operative and x-ray treatment in various types of cases and emphasized the need of co-operation between physician and surgeon in this work. Failure is generally due to lack of knowledge on the part of the operator, instead of the inability of the rays to produce the desired results.

X-Ray Treatment in Malignant Diseases.

Dr. F. R. Cook, New York City (*Int. Journal Surgery*, October, 1903) discusses methods of procedure and effects of x-ray treatment. He recommends the use of the rays in all cases whether operable or not. X-ray treatment should follow operations for an indefinite period of time.

X-Ray in Diseases of the Skin.

Dr. S. H. Hellar, of Lancaster (*Medical Society of Penn.*, October, 1903), has found least response to x-rays in sarcoma. In two cases the growth was stimulated. Good results were obtained in lupus, acne and ivy poisoning. Recurrences are rare. [Dr. Hellar would probably find better results in sarcoma by using more powerful radiations.]

Therapeutic Uses of the X-Ray.

Dr. J. T. Dunn, Louisville, Ky. (*Int. Journal of Surg.*, October, 1903), says "there is no doubt that x-rays will destroy the hair, sebaceous and sweat follicles when properly applied, permitting the permanent removal of the hair or simply temporary removal." Angioma can be removed by x-ray, but it is questionable if the resulting scar is not worse than the original mark. Treatment of skin diseases should be given with a soft tube. The follicles are affected after eighteen or twenty exposures and the reaction will continue two or three weeks. When it begins to subside treatment should be given two or three times per week for six or eight weeks, after which no recurrence need be feared. No scar results and frequently the complexion is improved.

A number of cases are reported, including hyperhidrosis, eczema, lupus, epithelioma, tubercular glands, carcinoma of the stomach, carcinoma of the bladder and uterus, and sarcoma involving the base of the bladder, in all of which the results were extremely satisfactory. In one case of carcinoma of the breast x-ray treatment was given until softening had well begun. After the reaction had disappeared the carcinoma was removed with the knife. Forty-eight hours afterward sloughing appeared the entire length of the incision,

from one to two inches wide. The wound is now healing by granulation. Probably the integument is so devitalized by such x-ray exposures that plastic work is not advisable.

A case of psuedo leukemia (Hodgkin's disease) was exposed fifteen days before the reaction was obtained. After ten days more he was much stronger and had gained sixteen pounds. He was again given fifteen exposures then allowed to go home for eight days. Eight more exposures followed. The glands in the neck entirely disappeared and after one year there was no recurrence.

X-Ray for Tuberculosis.

Doctors Boido and Boido, of Tucson, Ariz. (*Chicago Clinic*), have found the x-rays beneficial in cases of incipient tuberculosis among Mexicans. Out of fourteen cases eleven are living after two years, tho the majority of Mexicans die within one year after infection.

Tumors Benefited by X-Rays.

Dr. W. J. Eddy, Shelbyville, Ill., reports in *Ill. Med. Jour.*, August, 1903, a tumor involving half of the tibia in which the leg was nearly double its natural size. Six months later it had involved two-thirds of the tibia and was painful. Amputation being refused x-ray treatment was tried. A soft tube was used on alternate days. Dermatitis necessitated a week's vacation after the eighth treatment. After the next treatment the entire leg became edematous and the temperature rose to 103°. This condition lasted one week. Two weeks later inflammation had subsided and by free incision one and one-half pints of clear yellow serum was evacuated. The anterior half of the tibia was destroyed for one-third of its length. This was dressed in the usual way and soon healed.

Another case had a hard, immovable mass filling the axillary space. This was rapidly enlarging and giving much pain. After twelve x-ray treatments on alternate days a six to ten days' vacation was necessary. Treatment was resumed once or twice a week, as could be borne. The mass shrunk steadily, discharging a few drops of serum each day. The man has now a useful limb and is doing regular work.

Use of the X-Ray in Therapeutics.

Dr. F. H. Williams, Boston (*Med. News*, October 3, 1903), says all varieties of eczema yield to the x-ray without causing the patient any inconvenience. Psoriasis also responds very readily, as does acne, sycosis, favus, lupus, etc. Tuberculous glands, especially those in the neck, and tuberculous sinuses, yield readily. Some cases of conjunctivitis of long standing have yielded to x-rays. Painful affections of all kinds from causes known and unknown are frequently relieved, and a general tonic effect is often noted. In new growths if the glands are involved the x-rays seem to be of less avail. In other cases the new growths disappear in from two to twenty or more treatments.

The dangers of x-ray treatment consist in setting up a severe dermititis and in pushing the treatment too rapidly, causing serious toxemia. For internal diseases proper and powerful apparatus is required, otherwise the patient may grow worse instead of better.

Tuberculosis of the Conjunctiva Cured by X-Rays.—Sydney Stephenson reports the case of a child of four years who came for treatment of tuberculosis of the conjunctiva. The affected part was treated by exposure to the x-rays at a distance of 6 to 10 inches from the focus tube for an average period of ten minutes at each sitting. The only other treatment con-

sisted in bathing the eye three times with 1 in 5,000 sublimate lotion, and cod-liver oil and steel wine internally. The diagnosis of the case could not be questioned, as the bacilli were proved to be present. There is no visible cicatrization from the treatment, and the cure is complete. The treatment by x-rays is simple, painless, and free from danger, and it is likely in the future to displace the other methods of treating tuberculosis of the conjunctiva.—*British Medical Journal*, June 6, 1903.

New Treatment of Cicatrices.

Dr. H. R. Varney, Detroit (*Int. Journal of Surg.*, October, 1903) says mild applications of the x-ray stimulate cellular action almost exclusively. Elastic tissue, muscles and cartilages are affected only when the rays are used to an intense degree. Degenerative changes of the cells take place with inflammatory symptoms which increase the vitality and reproductive powers of the least differentiated tissues and produce degeneration in the more highly specialized structures such as hair and nails. The epithelial cells show the most energetic reaction both in diseased and normal tissues. Application of the rays after smallpox before the inflammation in the skin has subsided thus resulting in filling up the pit of the scar. The irradiations must begin very mildly, increasing in strength daily until inflammatory reaction appears. Treatment is then diminished until the pits are filled above the surrounding skin. No bad results follow except loss of hair which afterward returns. In the case of old scars the tissues are first scarified and then the rays applied.

Roentgen Rays in Medicine.

At a recent meeting of the Medical Society of New York State an afternoon was devoted to this subject. Dr. A. D. Bevan, of Chicago, said that while x-rays are of the greatest service in superficial cancers they have so far been without success in deep seated cancers. [This opinion is not borne out by the facts.—Ed.] X-rays cause dissociation of potassium iodid, and Dr. Bevan considers that x-ray treatment combined with iodin or arsenic opens a promising field.

Dr. C. L. Leonard, Philadelphia, said the value of the x-rays in diagnosis depends more on the expertness of the operator than upon any other factor. In more than 300 cases of examinations for calculi the aggregate error of positive and negative diagnosis as to calculus was less than 2 per cent.

Dr. Coley had seen a large number of recurrences after treatment by x-rays, especially in sarcomas. He reported a severe case of Hodgkin's disease in which there was marked improvement but after several months the liver became much enlarged and the patient died. Dr. Coley considers that there is a danger of disseminating the malignant process or of stimulating its growth by x-rays.

Dr. Hopkins, of Brooklyn, had found the combination of x-rays and Finsen light very useful, principally in surface cancer.

Dr. Ford, of Utica, considered the knife preferable to x-rays in all operable cases "The x-rays do not cure cancers." [Dr. Ford is evidently behind the age.]

Dr. N. Vandevere, of Albany, considers relief from pain to be a most valuable result of x-ray treatment. "The danger of the present use of the x-ray is that it may delay the use of more helpful measures."

Dr. Lee, of Brooklyn, called attention to the danger of general infection following the too rapid destruction of abnormal tissue under the x-ray.

The Influence of the Roentgen Ray on Epithelial Tissues.—M. Perthes gives the results of experiments made to determine the effect of the Roentgen ray on epithelial cells. After noticing the disappearance from his own hand of a wart following a slight Roentgen dermatitis, the writer treated similar growths on eighteen patients by covering one-half of the wart with a lead shield and exposing the other half to the Roentgen ray. In sixteen cases the exposed part of the wart became hard and then scaled, leaving an epidermal bed which healed after a few days; in two cases the reaction was more intense, giving rise to vesiculation. Two cases recurred. From a study of portions of tissue removed during the treatment, M. Perthes states that the effects of the Roentgen rays is exerted principally on epithelial cells. This conclusion was also reached by the results obtained by treating a recurrent rodent ulcer, which was entirely cured. The experiments were carried further by wounding equally both ears of a rabbit and exposing one ear to the Roentgen ray while the other was protected. Healing was greatly retarded in the exposed wound. M. Perthes concludes that the Roentgen ray exerts its influence principally on young epithelial cells, normal or cancerous.—*Am. Med.*

Forensic Importance of the Roentgen Rays.—Every physician who is liable to testify in court should make a special study of Roentgen diagnosis and should be thoroughly conversant with the structure of the epiphyses of the various bones and of the appearance of abnormal bones. D. Troeger (Friedreich's Bl. f. gericht. Med., Vol. 54, No. 4) believes that an x-ray photograph discloses better than anything else the presence of fractures and dislocations and their effect upon the bony skeleton with exception of the head and vertebral column, where the pictures frequently are not as clear as desired. Foreign bodies, if sufficiently large and of proper material, can be well located. For internal disease, the old methods frequently are more reliable, and absolutely no information can be obtained as to whether a newly born child had breathed during or after birth, or if pregnancy is present. The examiner must have experience extending over several years before his opinion can be accepted as conclusive.—*Med. News.*

Correspondence.

Dear Doctor—Will you kindly give me your opinion of the efficacy of electro-therapeutics in the treatment of a chronic tenosynovitis of the wrist and hand? In other words, what can you promise, in general, in such a case? Respectfully, O. O. Force, M. D.,
Pardeeville, Wis.

Chronic tenosynovitis most commonly results from a tubercular process, and tuberculosis in all its forms is amenable to electric and x-ray treatment. We suggest the use of the high frequency current in this case, alternating with x-rays from a tube of medium vacuum. Begin with five minutes' treatment on alternate days, the x-ray tube being ten to twelve inches from the wrist, and gradually extend the length of treatment as may be found necessary.

Dear Doctor—I notice in the October number of The X-Ray Journal that you discuss the value of quick lime and chlorid of calcium for keeping the static machine dry and in working order. I tried the chlorid of calcium and found that it destroyed the brushes quickly and got my machine in a terrible condition in a few days. I tried putting in ice and salt in a three-gallon tin can every day, setting the tall can upon a dish to catch the water condensed on the outside of can. This was a great deal of work and became tiresome. Now for the past year I have had no trouble whatever. No matter how moist the air may be, I put one quart of commercial sulfuric acid into two deep dishes, set one dish in each end of the case and screwed the doors up tight.

I also set the four legs of the static machine on four plates of double strength glass six inches square to insulate the case.

The dishes must be only half full, for they will absorb the water as fast as it enters the case. When the acid becomes too diluted, throw it away and put in fresh. One-half gallon of sulfuric acid has kept my machine in splendid working order for over a year and it is not expensive. I have not changed my brushes for a year, and the machine generates at all times, and under all circumstances. I would not want a better remedy against moisture.

M. H. SPRAGUE, M. D.
Ottumwa, Iowa.

LONGMONT, COLO., Oct. 23, 1903.

Dear Editor—I see an inquiry in the September X-RAY JOURNAL from Dr. G. D. P., of Caracas, Venezuela, in regard to what is the Crotte treatment for pulmonary tuberculosis. I will do the best I can to enlighten the x-ray readers in regard to the Crotte treatment.

Prof. Crotte, of Paris, France, was the originator of this treatment and has been using it and trying to introduce it to the medical profession for the past five or six years.

It has not been used in this country until the last six months. The first place it was used in was Colorado Springs. A woman claiming to be Madam Rade, of Paris, France, put in an institute at Colorado Springs, bringing the apparatus with her from Paris.

The treatment is a static kataphoresis; there are two medicine tanks put on the static machine, one on the negative terminal and one on the positive. The large brass balls are removed from the machine and nickel steel tanks four inches in diameter, reaching to the top of the static machine case, are fitted to the place where the brass balls are screwed on, by leaving a bolt projection long enough to fit in the hole where the ball is screwed on. The tanks are closed at both ends, but the lower ends are filled with sponges, and a tap with cap much like a bicycle valve, is fitted into the tanks so that one can medicate the sponges when needed. There is also an air tank fitting at the lower end of the tanks for putting on flexible, metal, cloth-covered tubes five feet long which are to conduct the medical vapors and current to the patients from the tanks. The positive tube is connected with the insulated platform and the negative with a long handled brush.

The tanks are charged with a 40 per cent formalin solution by keeping the sponges in the tanks wet with it.

The patient has the chest bared and painted with a solution of iodin crystals in alcohol, just strong enough to color the skin light yellow; then the patient sits on the platform chair and the machine running at a moderate speed the whole chest is sprayed with the brush electrode for from five to fifteen minutes.

The formalin solution is put into the tanks with an ordinary oil can.

I have the tanks on my machine and am using the treatment and will be able to tell what it will do in a few months.

One wishing to use this treatment who has a static machine can get the tanks and outfit all ready to attach to his machine for about $50 from the Cahn Electric Supply Company, Denver, Colo.

ROBERT A. BILLINGS, M. D.
